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ABSTRACT

The focus of this issue of Development Communication Report is the use of two-way radio to deliver medical services in isolated areas. Three articles provide (1) a discussion of the advantages, functions, and system components and costs of two-way systems--as well as problems--citing several projects in developing countries; (2) a description of a successful medical radio network in East Africa; and (3) guidelines for planning a two-way communication system. Also included is a description of a mass media educational campaign in Botswana, and a discussion of communications and the status of women. (MER)

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TWO-WAY RADIO HELPS DELIVER PRIMARY HEALTH CARE

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Two-way Radio Helps Deliver Primary Health Care

by Douglas Goldschmidt, Heather E. Hudson, and Wilma Lynn

The growing emphasis on the needs of the rural poor in the developing world has focused attention on creating innovative means of extending health care to rural areas. Given the shortage of physicians available to serve in rural areas and the prohibitive expense of providing a medical infrastructure to support them, health planners are turning to paraprofessionals at varying levels of training – nurses, health aides, midwives, and medics – to provide "front-line" rural health care.

However, the very isolation of rural areas creates difficulties in providing even relatively simple medical services. The delivery of drugs and supplies can take weeks or even months, and the transmission of data for and results of laboratory tests may take so long that such tests are an exercise in futility. In treating complicated cases, health workers must rely on their own limited training and skills, or risk an often difficult and expensive evacuation. Emergency referrals to hospitals may wait for days in many areas for transportation to be arranged.

Alaskan community health worker uses two-way radio to talk with physician-advisor

Aside from the various urgencies of health care, routine administrative and medical procedures may be significantly delayed or prevented in the absence of reliable communications. Further, for many of the medical personnel, the isolation of rural communities can contribute to loneliness, which induces high levels of staff turnover. Perhaps most important, without regular training and interchange of information on medical procedures, field staff can quickly fall behind in developing new skills, or even in maintaining current knowledge.

Two-way telecommunications offers some attractive solutions to the problems presented in such an environment. A two-way communication system offers the possibility of regular administrative and medical consultations, as well as a practical medium for other official and nonofficial communications.

Several technologies may be used for two-way communication: telephone transmitted over open wire, via microwave, or by satellite; and two-way radio – high frequency (HF), very high frequency (VHF), and citizens' band (CB). All of these technologies permit two-way voice communication between two sites, and some can be used for conferencing among several sites.

The various kinds of two-way radio systems most nearly fit into the category of appropriate communication technology for rural health care. In the absence of other telecommunications systems, two-way radio systems can provide for communication at varying degrees of reliability and relatively low capital cost. They are easy to maintain (although not always maintained in practice), easy to use by field personnel, and can provide years of service pending the eventual installation of regular telecommunications services.

While two-way radio systems are currently the most likely technology to be used in future rural health programs, however, they do not merit an uncritical endorsement. Two-way radio systems are almost invariably inferior to a properly functioning commercial telephone system in terms of both reliability and long-term capital and operational costs. Also, the proliferation of two-way radio systems can lead to unnecessary frequency congestion and can actually impede the development of regular telecommunications services. Nevertheless, in the absence of telecommunications services, two-way radio remains the most effective means of extending communications at the lowest cost.

Functions of a Two-way System

It is generally assumed that the most critical use of two-way communications for rural health is connecting the rural health practitioners with physicians and nurses in regional or national hospitals. Such contacts are used for consulting about a patient's condition for both diagnostic and prescriptive advice, determining whether a patient should be referred to a hospital for treatment, and following up on the condition of a patient at either the hospital or the field location.

The need for and importance of this type of communication depends heavily on the

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medical protocols of the particular project. In Alaska, the Public Health Service holds regular "doctor calls" for the rural health aides; the doctor contacts each health aide daily to provide medical consultation and handle administrative matters. These aides have minimal training (some less than three months) and frequently require skilled outside interventions. In Guyana, a "medex" – a health worker trained for one year by the MEDEX project – is generally expected *not* to consult with the physicians by radio except in the case of emergencies requiring referrals to hospitals, or in very difficult diagnoses.

The use of two-way radio systems for medical consultation thus reflects decisions made about the overall structure of the health system. The existence of the system allows varying degrees of consultation between the field and professionals, depending on the reliability of the radio system, the level of training of fieldworkers, and the availability of professional staff.

It should be understood that improvements in radio reliability generally bring about an increase in communication costs. A radio network that operates 24 hours a day is more expensive, in terms of number of frequencies and monitoring time required, than a simple HF system that can operate only during parts of the day. Thus, planners must evaluate the need for evening and weekend medical consultations when planning the radio system.

Two-way communications also plays a critical role in the administration of health programs, particularly in the distribution of drugs and medical supplies. In remote locations, epidemics or less serious outbreaks of disease may require immediate shipments of antibiotics, vaccines, and the like. However, with the unpredictable transportation and mail services available to many rural areas, it may take days, or weeks, for news of these needs to reach headquarters. Or the drug order may be received and headquarters may believe that it has been shipped, when in fact the drugs remain in a warehouse, ignored by the shipping agent. A two-way radio system can be used to monitor such shipments.

Similarly, the radio system can be helpful for ordering and shipping routine supplies such as food, furniture, fuel, and spare parts. The system allows headquarters to determine precisely what is needed if an order is vague, or to arrange substitutions if the requested supplies are not immediately available.

The radio can also be used for routine administrative and non-health-related matters, such as arranging for vacation replacements for fieldworkers, and arranging for messages to be relayed to various people at headquarters or in the field. While many of these functions do not have the same urgency as the distribution of drugs and supplies, the use of the radio not only speeds these processes along, but may help to significantly improve field staff morale. Given the generally acknowledged unmet demand for communications services in rural areas, planners should expect that there will be great pressures for using the health system for any number of general communications functions.

One of the greatest difficulties in rural medical care is arranging transportation for critically ill patients from the field to a regional or national medical center. An innovative approach to this problem is the Flying Doctor Service run by the African Medical and Relief Foundation (AMREF) in East Africa (see page 4), which links field professionals to each other, to hospitals, and to AMREF headquarters via a two-way radio system. The radios are used to alert a doctor, who can either fly to the site of the emergency or arrange for one of AMREF's airplanes to evacuate the patient.

Such unions of transportation and communications are particularly effective when both the medical and transportation systems have communications systems that allow messages to be conveyed rapidly from one to the other. For example, AMREF planes have one of the terrestrial network's frequencies, and in Lesotho, the Flying Doctor Service asked that the radio system be designed to include a network frequency in its plane.

An additional benefit of a two-way radio system, of course, is that some evacuations can be prevented if expert advice is available by radio.

The isolation of rural health workers poses problems for continuing their training or providing refresher courses. Two-way communications can help to alleviate the training problem, although the level of training made possible through two-way radio can vary tremendously according to the time professionals devote to preparing materials and the time students devote to studying on their own.

The simplest type of training occurs through fieldworkers discussing their cases during consultations in a conference-call situation. By listening in, each aide can hear varying descriptions of illnesses, learn ways of describing symptoms, and become aware of diagnoses and treatments possible for various symptoms.

A more directed approach has been adopted in Guyana. Once a week, during a general conference call, the physician presents a case that had been referred to him during the preceding week. The physician presents the symptoms, the types of diseases associated with the symptoms, approaches to diagnosis, and the like, and quizzes the medex listeners on the case.

An even more systematic approach is to present new ways of assessing medical problems through a series of presentations, questions, and follow-ups over a period of time. The difficulties here lie primarily in the time and professional effort required to develop the curriculum, and in the fact that the health workers must have time to participate in the program during the hours the radio system is operational. The limitations of HF radio systems in terms of reliability and signal quality also make this kind of intensive training difficult.

Two-way radio systems are earning an impressive reputation as a fast, inexpensive, and highly mobile way of dealing with emergencies such as epidemics and natural disasters. For example, during the 1976 earthquake which devastated many areas of Guatemala, Plenty, a voluntary organization, set up a two-way radio system that was one of the first emergency communications systems to operate during the disaster (see *DCR* 28). The system linked relief teams, ambulances, and local health workers with hospitals, clinics, and fire emergency units in the hard-hit lake country of Guatemala. In most villages, the radios were the only link with the outside world.

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ENTER THE *DCR* PHOTO CONTEST!

A picture is worth a thousand words! *Development Communication Report* is sponsoring a contest for photographs that illustrate "development communication" – that is, communication being used to support development projects. Photographs of any kind of communication process or medium – folk theater, face-to-face extension work, radio listening groups, educational television, film, print materials, satellite networks, etc. – will be eligible to win.

A selected jury will judge entries in two categories, black-and-white and color. Entries will be judged on the basis of content, visual impact, and technical quality. A prize of $100 will be awarded to the first place winner in each category, $50 to each second place winner. Prize-winning photographs will be published in future issues of *DCR*.

Entries may be either prints or 35mm slides. All entries should be in our hands by January 31, 1981. **Each entry must include the name and address of the person or organization submitting it and a short caption describing the photograph (where it was taken, what group or project it shows).** There is no limit to the number of photographs an individual or group may submit. All photographs entered in the contest will become the property of *Development Communication Report* and, if published, will carry a credit to the photographer.

Mail your entries to: Photo Contest, *Development Communication Report*, 1414 22nd Street, N.W., Washington, D.C. 20037, U.S.A.

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System Components and Costs

The primary reason Plenty was able to set up the Guatemala disaster relief network so quickly is that two-way radio technologies are fairly simple. The basic components of any two-way system, regardless of frequency or power are:

- a *transceiver* (a transmitter/receiver) with crystals that oscillate at the given frequency, and with a microphone, generally of the "push to talk" variety, that activates the transmitter only when a button is depressed;
- an *antenna* for radiation and reception of signals, either dipole (generally suspended between two poles or trees), whip (a vertical antenna that may be pulled out of the radio or mounted outside, like a car radio antenna), or yaggi (a vertical antenna like a VHF TV antenna, mounted outside);
- a *power supply*, either AC (operating off of mains power — house current — by plugging in the set), or DC (operating off of a storage battery such as an automobile battery, which may be recharged by connecting a battery charger to the mains power, to a small diesel generator, or to one or more solar collector panels, generally mounted on the roof).

Of the various two-way radio technologies, high frequency radio is perhaps the most common. High frequency (HF) communication works by bouncing radio waves off the ionosphere and can cover great distances of hundreds or thousands of miles, with varying reliability. HF radio offers the most practical means of communication where distances exceed line of sight between locations (where stations "see" each other electrically) — generally 50 miles or more.

Very high frequency (VHF) radio can be used where distances between communities are less than 50 miles, or where a hill or mountain can be used for a repeater that allows the signal's line of sight to cover a much greater area. The reliability of VHF communication is generally good within its limited range.

Citizens' band (CB) radios offer very inexpensive communication over short distances of about 5 to 20 miles. CB radios are small and portable, but are generally not designed for the rugged conditions of field settings.

Definitive cost data on two-way radio systems are difficult to provide, given differences in project requirements, terrain, atmospheric conditions, import duties, shipping costs, and the like. It is, however, possible to provide at least some idea of the relative costs of different technologies, and some of the factors that influence costs.

Based on data from Guyana, the purchase cost of a typical high frequency two-way field radio site would be around U.S. $1,325.00, the bulk of this for the four-channel radio ($900). Radios for longer distances and for base stations, requiring more power, would be more expensive. Non-U.S. equipment, particularly from Europe or Canada, is likely to be about 50 percent more expensive than U.S. equipment. For the power supply source, solar cells are currently about twice as expensive as diesel generators, but they have little or no operating expense, and costs of solar cells are gradually decreasing.

VHF radios are somewhat less expensive than HF and can be used with a yaggi, or TV-type, antenna, rather than the dipole antenna required for HF systems. The cost of a typical VHF installation with a 50-mile operating radius would be approximately U.S. $900.00. For longer distances, repeaters would be necessary, and costs would be significantly increased.

Citizens' band radios are very inexpensive ($100 to $300) and may be used with a built-in whip antenna. The power supply could be throwaway batteries (an ongoing operational cost) or rechargeable nickel cadmium batteries requiring a power source for the battery charger.

These costs are only part of the *capital* costs of a two-way radio system. Total capital costs include the capitalized cost of the equipment plus its installation, spare parts, and power supplies. System planners must also take into consideration the *operational* costs — maintenance, power requirements, operators, equipment depreciation.

The operating costs of a system may vary according to:

- whether maintenance is done by health agency staff, a telecommunications agency, or expatriates;
- the life of the equipment — generally estimated at five years, although solid-state radios protected from salt and dust should last considerably longer;
- the power supply;
- field maintenance — whether an annual field visit is scheduled or equipment is simply repaired when broken;
- accessibility of sites for shipping equipment and for maintenance visits;
- whether radio operators are hired and paid for that job alone or operate the radio as part of their clerical or clinic duties.

In Guyana, the initial estimate that maintenance would cost $150 per site per year has been revised upward. In Sudan and Lesotho, the cost of shipping and installation was estimated at 80 percent of the capital cost of the equipment. Generally, the least expensive system will be installed and repaired by local technicians (usually in the telecommunications ministry) and powered by solar arrays or off of mains power.

Problems with Two-way Systems

While it is often difficult to establish the reasons for failure of two-way radio systems, there are several major causes of system breakdown and failure: poor system design, insufficient training of users, inadequate operational procedures, lack of maintenance protocols, lack of spare parts, and power supply problems.

Faulty system design occurs most often when attempts are made to minimize initial capital costs. Such savings may be attempted by purchasing older or used equipment or by purchasing less expensive equipment, such as CB radios, in the belief that they will provide the necessary service. In fact, with older equipment, operational problems are frequent and are compounded by the difficulty of getting spare parts, and older equipment consumes more power. As already noted, CB radios cover a limited distance and are not very reliable.

Operational procedures are also a source of radio problems. Such problems range from operators being careless with handling the microphones or placing objects over the heat exhaust of the transceiver, to lax security and placement of transceivers in poor locations such as areas exposed to moisture or heat, dust or salinity. For example, in Guyana, the main station of the MEDEX radio system was directly exposed to humid salt air blowing in off the ocean. Without remedy, this radio would have been corroded beyond repair in less than two years.

Lack of training of operators can result in early damage to equipment: radios are allowed to burn out or corrode, batteries are not charged properly, battery cables to battery terminals are reversed, or gasoline is not properly mixed with oil for generators.

Maintenance protocols are a major consideration in the success of two-way radio systems. While solid-state radios should operate for long periods of time without the need for maintenance by a technician, some periodic preventive maintenance is advisable, as lack of routine maintenance may severely shorten the life of the system. For example, inspectors in Lesotho found that many of the antenna installations needed repair — antennas had broken, radios were not grounded, and poles were leaning dangerously. In the Pacific, moisture in long grass around the guy wires for the poles rusted the couplings holding the guy wires. The guys broke, the poles fell over, and the antennas came down. Cutting grass can extend the life of a radio system!

One reasonable approach to system maintenance is to contract with the local telecommunications authority for installation and maintenance. In many projects, there is reluctance to use the telecommunications authority, whether because of its operational record, a traditional lack of cooperation among ministries, or the cost. However, the telecommunications authority usually is best suited to maintain the radios because of its own supply of skilled technicians and established repair facilities.

Lack of spare parts can also threaten the

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A Successful Medical Radio Network in East Africa

by Michael S. Gerber

The governments of many Third World countries, particularly those experiencing significant political unrest, are understandably sensitive to the political implications of installing extensive two-way radio systems linking rural outpost to rural outpost and to population centers. As a result, planners often hesitate to explore the potential of two-way radio for helping to solve health care delivery problems. One agency has proven, however, that it is possible to operate a highly successful two-way system with full government support.

The African Medical and Research Foundation — AMREF — operates a medical radio network with stations in Kenya, Tanzania, the Sudan, and Uganda. It is the only organization that currently has permission — and Ministry of Health financial support — to operate across the borders of Kenya and Tanzania. AMREF has earned this privilege not only by taking the time to win the confidence of the governments concerned, but also by providing services of unquestioned value to rural areas where there was no existing structured program for health care delivery.

AMREF was founded in 1957 to provide clinical services, mainly mobile health care by ground and air teams, to rural areas of Kenya and Tanzania. The air teams — "Flying Doctors" — provided surgical services to hospitals and clinics where there were no fully trained health professionals.

In 1961, AMREF began installing two-way radios in a number of selected mission hospitals to let doctors know when emergency evacuations were required and when surgical teams were needed at remote clinics and hospitals. The radio network has since developed into one of the largest medical radio communication systems in Africa, with 93 stations — 50 in Kenya, 38 in Tanzania, 4 in the Sudan, and 1 in Uganda. As the system has expanded, so have its purposes. Isolated stations without telephones or good transportation use the system to communicate not only with the central station in Nairobi but also with one another, and not only for medical consultation but also for discussing community health problems, ordering drugs and supplies, transmitting laboratory reports, discussing administrative matters, and planning and coordinating Flying Doctors' visits.

The medical institutions participating in the network are both mission- and government-run, and include consultant hospitals, regional or provincial hospitals, district hospitals, health centers, dispensaries, and mobile units. The radio network covers most of the remote, frequently arid or semi-arid regions of Tanzania and Kenya. Tanzania's system is limited mainly to hospitals, allowing for communication along established administrative lines from district to regional to zonal hospitals. The Kenyan system also provides for district medical and public health teams to communicate with primary health facilities, and in some cases with mobile units, within their district. In an evaluation effort now in progress, AMREF is trying to determine whether the communication needs of remote health facilities are satisfied by the present network, and, if not, what is needed to provide more complete coverage.

AMREF is also helping the Ministry of Health in Malawi to establish a medical radio communication system. A trial system of 10 radios was installed in 1977, and the ministry has since requested support in extending the network to 6 additional sites.

Equipment and Maintenance

The AMREF network uses mainly PYE SS 130 high frequency radios and is in the process of replacing a few older models still in operation, using funds provided by the Netherlands. Standardization of the equipment will facilitate service and maintenance and allow for the consolidation of testing equipment. A pilot effort is underway in the Lamu area on the Kenyan coast to test the use of solar panels as an alternative energy source for recharging batteries. If the results are satisfactory, the use of solar energy will be extended to other stations in the near future. AMREF's full-time radio engineer is responsible for installation, routine maintenance, and servicing of the entire system, as well as for repairs of all radio equipment.

Operation and Personnel

The radio network uses three frequencies, two of which are monitored directly by the control station (Foundation Control) in Nairobi, and the third by a control station located at the Kilimanjaro Christian Medical Centre in Moshi, Tanzania, backed up by Foundation Control. In addition to these HF stations, a small VHF system is operated out of the Lamu District Hospital, connecting the district headquarters with three outstations within a radius of 35 miles.

Foundation Control Nairobi operates five days a week from 8 A.M. to 12:30 P.M. and from 2 P.M. to 4:30 P.M. These hours are being reconsidered in the light of requests for an expanded schedule that would include weekend hours. Nighttime operation is generally not possible because of atmospheric conditions.

Apart from daily calls to Foundation Control, several outstations also use the radio to communicate with other stations in their geographical area. In fact, preliminary findings from the evaluation study indicate that the traffic within these groups of outstations is increasing markedly in comparison with the traffic between outstations and Foundation Control. In 1978, when the system had 82 stations, total traffic for the network was more than 2,200 calls per month. Of these, 829 were handled by Foundation Control in Nairobi, 372 by the control station at Moshi, and more than 1,000 calls were made between outstations. In an attempt to avoid confusion and congestion during the limited airtime available, Foundation Control now allocates fixed daily times for each group of outstations to hold their local conferences.

The radio room at Foundation Control is staffed by four fully trained nurses who, in addition to monitoring the radio, assist AMREF's Flying Doctors in surgery. Operators at the outstations vary a great deal in terms of their professional training and experience. At some district hospitals, the radio is operated by a senior secretary who passes messages back and forth, directing medical matters to doctors or medical personnel, administrative matters to the hospital superintendent, drug and supply requests to the pharmacist, and so forth. At other hospitals, the doctor or nurse in charge operates and coordinates all radio traffic. At smaller stations coordination is less difficult, as there is usually no more than a total staff of four.

Procedures to operate the radio are usually explained by the technician who installs the radio, and some in-service training is given by the AMREF pilots and medical staff during medical outreach visits. However, the high rate of staff turnover, particularly in government institutions in remote areas of the country, tends to affect the communication system adversely in terms of both the quality of cooperation between stations and the extent to which the radio is used. AMREF is trying to devise measures to improve the training of operators so that new staff will be able to use the system with confidence.

Use of the Radio

A number of factors influence the radio's use and the nature of radio traffic. In addition to the interest and training of the staff, the use is influenced by characteristics such as the type and level of the participating institution (mission or government, hospital or dispensary), the distance to the closest referral institution, the staff's confidence in the medical expertise at the referral institution or district headquarters, the effectiveness of the regular supply system, security conditions, and so forth.

AMREF's evaluation includes a systematic analysis of the present functions and uses of the communications network, using data from the log maintained at each station. Of the

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Project Planning

This regular feature of DCR highlights for development planners the process of planning a communication project or the communication component of a project. Readers are invited to submit descriptions of their own project planning experiences, or suggestions for topics in communication planning that they would like to see treated in future issues.

An Approach to Planning a Two-way Communication System

by Paul Zukin

The past few years have seen considerable interest in the role of two-way communications, both to assist the development process in developing countries and to augment health and other services in isolated rural communities of developed and developing countries alike. This interest has been stimulated by such technological advances as solid state devices (transistors and integrated circuits), solar power, and satellites, and has been brought into perspective by the recent emphasis on appropriate technology.

Although two-way communications has many potential uses in any country, its application to rural health care has received most attention to date. The presentation that follows will discuss communication planning in the context of a health service model. The planning approach that is described has been used to develop a successful national health planning unit and to design a primary health care program in Ghana, as well as to plan a number of hospital and health services projects in other countries. The approach, however, is general in nature and therefore is applicable to planning for products or services in any sector.

The Planning Process

Effective planning requires an organized approach to achieve desired goals. If an organization is to provide a product or service it must first establish its policies or operating rules. These provide guidelines on how the organization or project will function and essentially spell out what will and will not be accomplished. Although not all policies are formalized as written statements, a written policy is preferable, as it leaves less room for the intent of the activity to be violated.

Once policy guidelines are set, planning is carried out for the subsystems that make up the organization. In a commercial organization these are the *marketing, production, human resources,* and *financial* subsystems. At first glance it would seem that not all of these terms would be appropriate in planning for service organizations. However, on closer analysis, the conceptual framework holds.

In many circles the term "marketing" is not well understood and may have negative connotations, suggesting that a seller is trying to convince a consumer to purchase something he or she does not need. This misconception can block recognition of the fact that the functions encompassed in the marketing concept play an important role in planning a communication system. These functions include:

- assessing the needs and demands for communications to support health care and/or other activities;
- deciding on the types and characteristics of communication equipment, facilities, and services that will meet these needs and demands in a practical, affordable, and cost-effective manner – that is, the communication system design;
- designing a program to promote the use of communications to support health services;
- considering the effect of price (charges for services) on the use of communications.

The production subsystem includes the sequence of activities that will result in the desired communication system. These activities must occur at the right time, place, and rate, and with the proper emphasis. They include securing and installing appropriate communication hardware, power supplies, and antennas or telephone lines; devising maintenance programs; and providing for supplies and spare parts.

The human resources subsystem focuses on personnel needs assessment and staffing, as derived from needs projections and the production subsystem. It includes forecasting training needs and establishing training programs, developing human resources, assessing and evaluating performance on the job, developing rewards and incentive systems, and establishing conditions of service for employees.

The fourth subsystem, finance, is concerned with sources of funds, both for capital expenditures and for operation and maintenance of the communication system; the use of funds, including expenditure controls; and the costing of equipment, facilities, and services.

The Planning Pyramid

In planning for a communication system, one subsystem – marketing – analyzes and specifies communication needs and demands and how they can be fulfilled, and three subsystems actually achieve fulfillment. Planning is the process of integrating these four subsystems so that they come together in a single focus or "mission."

The four subsystems rarely mesh neatly. There are almost always more needs and demands than can be met. Even if there were a communication system that had the equipment and facilities to meet all of the needs of its clients, it probably would not have enough qualified people to operate and maintain it. Even if all of the required staff were available, financial and other resources might be limited. There are gaps or limitations in what can be provided, given scarcity of health workers and other resources, and taking into account political, legal, cultural, and other constraints. In the process of planning, the organization must adjust its goals to accommodate these realities. This means setting priorities, satisfying some needs and ignoring others.

One way of conceptualizing the planning process is to visualize a "planning pyramid," in which each subsystem makes up one side of the pyramid. In effect, the planners begin the planning effort at the bottom of the pyramid and travel upward around the sides, passing again and again through each of the subsystems, narrowing the gaps and accommodating the limitations. In this process they establish and revise priorities. By the time they arrive at the top of the pyramid, they should have identified a communication system that will meet the recognized needs and will specify which services will be provided, how, and using what resources.

Communication System Issues

In negotiating the planning pyramid for a two-way communication system in support of a health program, planners must analyze, weigh, and resolve a number of significant issues in each of the four organizational subsystems, only some of which are listed below. Under the marketing subsystem, for example, the following issues will emerge:

- Do the information needs in providing personal health care include:
  - exchange of information between health workers;
  - consultation on individual patients;
  - patient referral;
  - patient-family contact?
- Do the information needs in managing the health care system include:
  - improved management of personnel, drugs, supplies, transport, and other resources;
  - management conferences and in-service training;
  - reporting financial and other health system data;
  - improved epidemiologic surveillance;
  - strengthening health worker morale?
- What technical features and options will be chosen in designing the system?
  - line communication (telephone) or radio;
  - if radio, one-way or two-way;

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- satellite or non-satellite transmission;
- amplitude modulation (AM), frequency modulation (FM), or single side band (SSB);
- high frequency (HF) or very high frequency (VHF);
- solid state or tubes (valves);
- AC mains, battery, or solar cell power;
- transmitting frequency;
- power of transmitter;
- antenna type.

- Will the system be dedicated to one user group (health services) or non-dedicated?
- Who will have access to the system, and under what circumstances?
- What provisions are there to ensure that communicated requests can be met?
- What will be the relationship between the communications and transportation systems?
- How will political and security considerations be handled? Legal and regulatory?
- What are the sociocultural aspects that must be considered in designing the system?

Under the production subsystem, the issues will be related to:

- Equipment selection, procurement, and installation;
- Equipment maintenance;
- Protection against misuse and theft;
- System performance evaluation.

Under the human resources subsystem, planners will have to provide for:

- Inclusion of training in the use of communication equipment early in the training programs of health workers at all levels, particularly of those working in rural or isolated areas, so that its use will be ingrained and its value recognized;
- Training in maintenance of the equipment.

Financial subsystem issues include:

- Where and how funds for the purchase of communication equipment can be obtained;
- Funding for operation and maintenance;
- Foreign exchange considerations.

In sum, planning a two-way communication system for a developing nation requires an organized approach and careful analysis of many issues and questions, including technical matters, distances to be covered by the system, weather and terrain, institutions to be involved, available funds, and any number of considerations not mentioned here. There are significant differences among developing countries, and no "cookbook" method to planning a communication system is possible. However, a rational and comprehensive approach to the entire system will give the communication system that results a greater chance of success. ■

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Botswana Takes Participatory Approach to Mass Media Educational Campaign

by Martin L. Byram, Catherine B. Kuate, and Kutlwano Motenge

In a time when development planners are coming to recognize that community participation is an indispensable ingredient of successful development projects, mass media educational campaigns are often criticized for being inherently a top-down, centralized, nonparticipatory communication method. Critics acknowledge that mass media campaigns have the advantage of being able to provide education to large numbers of people, including the illiterate, at a relatively low cost. On the whole, however, mass campaigns have tended to focus on messages selected by central agencies and institutions, and the planning and preparation has also tended to rest with them.

Centralization is not necessarily wrong, of course. In many instances, such as the mass sanitation and preventative health campaigns in China and the radio learning group campaigns in Tanzania (see *DCR* 17), the case can be made that centrally planned campaigns have had significant social and economic benefits. Nevertheless, consideration needs to be given to the potential for developing a more participatory approach to mass campaigns.

Experience has shown that there are advantages to involving people directly in planning and running the educational programs that concern them. Such involvement helps to ensure that the priority concerns of the community are addressed realistically, and it encourages people to take advantage of the benefits of these educational programs. In making the case for a more participatory approach, however, we should not lose sight of the fact that many development problems are so massive that very often they can be tackled effectively only by taking a large-scale approach. What is needed, then, is a balance between the obvious benefits of a mass campaign approach and those accruing from a more decentralized and participatory approach to adult education.

Such a balance was sought in a recent mass campaign organized in the Kalahari Desert region of western Botswana, an area with a widely scattered population of some 50,000 people. The campaign, *Lesedi la Puso* ("Understanding Government") used a radio learning group format: organized groups met at regular intervals over a short period of time to listen and respond to information on specific topics broadcast over the radio and supported by print and visual materials. This radio learning group campaign was organized by Matsha Community College (a new multipurpose educational center), with the help of the four district councils and other government departments in the region.

The campaign was planned to respond to villagers' requests for more information about how government works and how people could get things done for their communities. Before the campaign, people had often expressed in village meetings their feeling of distance from government, indicating that they lacked basic information about government and its procedures and about their own rights and responsibilities as citizens. Similarly, local civil servants felt that the villagers' lack of understanding about government hampered development efforts.

A radio learning group (RLG) campaign seemed a good approach to this problem:

- Radio was the most economical means of reaching out to the scattered settlements in the region, an area which covers about half of Botswana's land surface.
- A learning group approach (group meetings led by locally selected and trained voluntary group leaders) seemed the most efficient way of involving large numbers of people in an organized learning situation in an area where there are relatively few extension workers.

Furthermore, Botswana already had experience with mass campaigns, having conducted national radio learning group campaigns in 1973 and 1976. The RLG approach had been tested, and there was a body of knowledge and experience in the country on which to build.

The two previous campaigns had been based on centrally conceived issues, one on the third national development plan and the other on the government's proposals for a tribal grazing land policy. In contrast, *Lesedi la Puso,* although initiated by civil servants, was planned in response to specific concerns identified in the villages, and there was a conscious attempt to develop a participatory and decentralized approach throughout the campaign. Because civics education is a potentially sensitive area, it was necessary to get central government approval. Once this had been obtained, however, control of the campaign resided largely within the region, with a minimum of dependence on central government agencies.

Since the campaign was a regional program, it allowed for some experimentation in developing a more participatory approach to mass campaigns, efforts that are best illustrated in the following aspects of the campaign's organization:

1. village survey;
2. production of materials;
3. processing feedback from the groups.

The Village Survey

The central theme of the campaign – "government and the citizen" – represented the generalized common concern about government's remoteness and villagers' lack of familiarity with government practices. In order to prepare study materials, this generalized concern had to be translated into something more concrete. A baseline survey was needed to identify the specific gaps and misunderstandings that were of greatest concern to the villagers and to ensure that the materials produced reflected these concerns. Eight university students were employed to carry out the survey, working in teams of two. During their three-day training session the students pre-tested the draft questionnaires that had been prepared for the survey, using an open-ended interview method to encourage the villagers to express their opinions freely.

The survey offered the first real opportunity to involve villagers in the campaign. It was considered important that when the research teams visited a settlement they would not simply collect data and then depart, but rather would use the occasion to discuss the campaign with the villagers and to encourage the villagers to start thinking collectively about the issues they considered to be important. When research team members visited a settlement the intended procedure was:

1. They would begin by holding a village meeting to introduce themselves, describe the purpose of their visit, and discuss in general terms the issues, concerns, and opinions that people had about government and village development.

2. After the meeting, they would interview villagers to obtain more detailed information on issues raised at the meeting.

3. Before leaving the village they would report to a second meeting to summarize the information they had collected, giving people a chance to verify it and discuss further any points of particular concern to them.

Unfortunately, it was not always possible to follow this process through in its entirety. The research teams did not have their own transport and had to rely on others to get from one village to the next, thus it was not always possible to arrange for the first village meeting. However, in almost every case a meeting was held before the team left the village, and people seemed to welcome the chance to listen to and discuss the results of the survey.

The data from the village survey was analyzed and documented village-by-village, and district and regional summaries were prepared. Although the survey data gave only a general outline of village problems and people's concerns about government, it was a useful source of information for selecting specific topics and preparing materials for the campaign. It gave a clearer picture of the issues and identified areas of concern that the organizers had not originally seen as a problem.

Production of Materials

Extension officers from the campaign region met together in a one-week workshop to identify 10 specific campaign topics and to produce the outlines for the materials that were to make up the campaign package for each topic: a radio program, a study guide, a flipchart, and discussion questions. Using the information from the survey report and their own knowledge of the region, the extension officers selected 10 topics on civics education for the campaign, taking into consideration such questions as:

- What topics are of relevance to the general population of the region, and not just to a minority?
- What can the districts cope with in terms of increased demands on their services as a result of the campaign?
- What topics can the districts deal with in terms of providing follow-up nonformal education programs?
- What information will be useful to the districts for planning future development and extension activities?

The topics they chose were voting and elections, elected representatives, the civil service, cooperatives, water, health, education, wildlife, local government tax, and district development planning.

Once the topics had been selected the workshop participants divided into groups to work out the themes and the specific objectives for each topic. For example, it was decided that the program on voting and elections should contain information on why people vote, who can vote, how to vote, and deciding whom to vote for. The group worked together to identify the detailed points to be included in the materials for each objective – the basic technical data, major policy issues, and significant examples from the region. The first drafts of the campaign materials were prepared from this information. By the end of the week, workshop participants had recorded improvised radio dramas, written outlines of the study guide chapters, drafted discussion questions, and, with the aid of an artist, sketched out ideas for flipchart pictures for each of the campaign topics.

The preliminary outlines provided the basis for the learning package that was developed for use by the radio learning groups. Extension officers who had been involved in the workshop wrote the final versions of the ten individual chapters of the study guide. The Kweneng District School Inspector, for example, wrote the chapter on education; the Ghanzi District Council Secretary wrote the chapter on elected representatives. In addition to providing factual information, each chapter included discussion questions and advice on where people could go to get further information after the campaign was over.

Placing the production of materials in the hands of the local extension staff was important. It meant that the significant decisions on campaign content were made by people who worked and lived in the campaign region, and that the campaign materials contained local information directly relevant to that region. It also meant that the extension officers – the people responsible for actually making the campaign work – had a vested interest in seeing the campaign succeed. The first workshop was important psychologically. It was the first time the four districts had come together on the campaign, and when they did, they made some clear, practical decisions that shaped the whole course of the campaign.

The final versions of the radio programs

A meeting of one of the Lesedi la Puso *radio learning groups*

were produced by the extension workers in a second workshop. Using the ideas generated earlier, they worked out more detailed dramas and recorded these in the Radio Botswana studios. A technical information section was later added to each program; in most cases this consisted of an interview or talk given by a council or government officer. The ten 30-minute radio programs were broadcast over a five-week period in June and July of 1979.

Feedback from the RLGs

One of the objectives of *Lesedi la Puso* was to obtain villagers' views and opinions on various aspects of government policy and practice. This consultation aspect of RLG campaigns has received considerable attention in Botswana. In the 1976 RLG campaign on tribal grazing land, for example, over 25,000 feedback forms were mailed in by the radio learning groups and were processed by government to obtain the grassroots reaction to the proposed changes in the land tenure system.

The organizers of the *Lesedi la Puso* campaign realized that the campaign provided the districts with the opportunity to consult people on future district development plans. Data from the groups could have an immediate impact on a government district planning exercise that was to take place at roughly the same time as the campaign. In effect, it would mean that the radio learning groups would be involved not only in discussing the campaign content but also in contributing to the planning of facilities and services for their villages.

Discussion questions and report forms provided the mechanism for this consultation. The groups were asked to record their responses to the campaign discussion questions, and any questions they wanted to ask, on a report form which they returned to their district centers. In each district center the responses were analyzed question-by-question and topic-by-topic and recorded on summary sheets. The summary sheets gave an overall picture of group responses for each question, which district staff could then review for development planning purposes.

Questions sent in by the groups were, in most cases, answered by district staff. Questions relating to national policy issues were referred to central government ministries. Answers were broadcast over the radio in a series of 16 Answer Programs for a two-month period immediately following the campaign broadcasts. During this period 336 questions were answered.

A Critique

The evaluation of the campaign suggested that it had been successful. Over 250 radio learning groups involving some 3,000-3,500 people had been organized in an area where communication is extremely difficult and the population is scattered. The results showed that there was a definite increase in people's knowledge and awareness of government and of how they can participate in the development process. However, it is worth taking a closer look at the campaign to determine to what extent the attempt at developing a participatory approach was successful.

First, it is clear beyond debate that the campaign was organized in response to the villagers' previously expressed concerns. The village survey process then gave the people a chance to express their concerns in more specific and detailed terms. However, although the survey gave a clearer picture of people's perceptions of government, if it had been organized a little differently, villagers could have been more involved in actually selecting the campaign topics. If, at the second village meeting, the villagers had been asked to identify perhaps the three issues that they considered to be the most important, there would have been some indication of what they saw as the priority topics. A combined list of the priorities from all the villages would then have provided a basis for selecting the campaign content, rather than having government officials make arbitrary choices from the general information collected. Furthermore, the process of selecting the important issues would have helped deepen the people's understanding, as they would have had to decide why one issue was more important than another.

If this were taken a step further, one might ask how villagers could be involved in the actual preparation of materials. As it was, once the village survey was over, villagers were not directly involved in the campaign again until the radio learning group meetings. Obviously it would not be possible to involve large numbers of people in the production of materials, yet the production process employed in the campaign did help to demystify the preparation of materials and demonstrated that non-technical people can produce good educational materials.

Logically, then, there seems to be no reason not to have involved village representatives, and not just extension officers, in the materials production process. In a workshop situation village representatives would have been equally capable of selecting topics and establishing the content and format of the materials. Any fears about levels of literacy could have been overcome by having village representatives and extension officers work side by side, with the extension officers taking responsibility, as they did in the campaign, for actually producing the written materials once the basic ideas had been discussed. There would, of course, be no literacy problem with the recording of the radio programs. This combination of village representatives and extension officers would have helped to overcome the tendency of extension workers to be biased toward an official perspective, as the villagers would be more likely to base their ideas and suggestions on their own experiences in the villages.

Finally, one needs to ask how effectively the feedback from the groups was used. The dangers of giving people a false sense of participation in the formulation of development policies have been raised by others in the past. In the case of *Lesedi la Puso* the feedback did give some guidance to district planners, but the information was not used as systematically as it might have been. This was basically an organizational problem that could have been solved by building district meetings into the campaign to discuss the summary sheets and systematically draw out the points that were of significance to development planning.

Of course, all of this is hindsight. Just as in any adult education program there were real organizational constraints involved in *Lesedi la Puso*. Organizing an RLG campaign is a mammoth task involving a great deal of hard work. *Lesedi la Puso* was organized by district staff who had to carry on their normal duties at the same time. Four different districts were involved, and the staff had no opportunity to meet together on a regular basis. There was only one person working full-time on the project, the Matsha coordinator. Once final approval had been given by all the parties involved, only 15 months remained before the campaign was to begin. Given these kinds of constraints and the heavy work load, it was not always possible to do things in the most desirable way; in some instances things were rushed and ideas were not fully developed.

In spite of these constraints, *Lesedi la Puso* did demonstrate some of the possibilities for a more participatory approach to mass campaigns. This is not to say that there was no centralized planning, for clearly there was, although in this case it was at the regional level. However, in trying to strike a balance between centralization and participation, the campaign gained some of the advantages of each. The points made above suggest that with some organizational adjustments in such areas as content planning, materials production, and feedback processing, more participation in the planning of mass campaigns can be encouraged without losing the benefits of scale. ■

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A report on this campaign, Lesedi la Puso: A Radio Learning Group Campaign in Western Botswana, *is available from the Boipelego Education Project, Ministry of Education, Botswana.*

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A Communicator's Checklist

1 ***From the Field: Tested Participatory Activities for Trainers,*** compiled by Catherine D. Crone and Carman St. John Hunter (New York: World Education, 1980), 148 pp.

The complexities of teaching adults are becoming apparent to an increasing number of individuals who, although not trained in adult education, find that the effectiveness of their work depends on their abilities to facilitate adult learning groups. *From the Field* is a practical tool not only for the skilled trainer but also for the individual who, having been exposed only to traditional educational methods as a learner, needs to become aware of nonformal education methods that have been proven successful with adults. The volume contains approximately 50 activities and exercises designed and tested in the field by established trainers and consultants, adapted to a format that can be easily understood, used, and adjusted when necessary to a wide range of situations.

Although *From the Field* was originally designed to help trainers prepare other individuals such as teachers, fieldworkers, and community organizers, its applicability is not limited to any particular content area. The key is the process it facilitates, and that process is highly adaptable to any number of educational situations. The approach it supports is participant centered and emphasizes mutual learning. Thus, its implementation requires that some individuals shed their traditional biases and preconceptions about learning in order to create valuable experiences through "learning by doing." The trainer is urged to be a facilitator, a consultant, an initiator, a listener, and a learner who also grows from the experiences shared with the participants.

From the Field is meant to be used as a resource book from which the trainer picks and chooses the most appropriate activities from a varied collection. The binder format is designed in such a way that the logical development of an effective learning experience is reflected in the arrangement of the sections, from forming a working group through evaluating sessions. Each section is preceded by a brief discussion of the particular training concept being addressed and is followed by diverse activities from which the trainer can choose. Section I suggests activities to establish the atmosphere of trust and cooperation necessary to the success of a learning experience and helps to establish participant and trainer expectations. Section II eases the mutual discovery of needs and examines means for collecting information from and about learners. Section III addresses methods to insure the necessary link between participant needs and appropriate approaches and techniques, and it encourages adults to take an active role in their own learning. Activities for evaluating learning sessions and trainers' performance are stressed in Section IV. While the first four sections reflect the logical flow of training design and implementation, Section V provides models and opportunities that can be used to help the participants practice their own skills as educators in planning and testing learning activities.

The real practicality of *From the Field* is appreciated most when one is implementing some of the suggested exercises. Even the layperson with a minimum of expertise feels a sense of security in testing an activity. The format on which each is based is not overly simplified and explains why the trainers chose the particular activity, the setting and materials used, steps for conducting the activity, and an explanation of what happened when it was originally used. The reader is given the opportunity to judge whether or not the activity would suit his/her respective group needs. There is also the freedom to vary the activity. One is left with the sense that the authors would prefer that their audience be creative with these basic exercises. The collection is sensitive to the wide array of group needs with which a trainer is faced, and if an activity in a particular section is not applicable, there is usually one that follows or can be varied that is.

One area that is treated, for example, is the difficult moment for many trainers, experienced or novice, of initially encountering a new group. *From the Field* suggests several approaches so perceptive of basic human interaction and group process that one exercise, "The Ice Breaker," was used successfully with trainers in Indonesia and with representatives of social service groups in Panama, with no basic changes except language. An exercise entitled "Discussing an Article," originally used to engage adults from rural New York in an active discussion about their roles as teachers, was slightly altered and used to help a Central American training team establish the training philosophy on which it designed a series of workshops. The use of an exercise on "How to Assess Learning" demystifies the seemingly difficult task of evaluation to the point that it becomes manageable. The participants realize that they already have evaluation skills that can be perfected even more.

From the Field is a resource that stimulates the participatory nonformal education process by offering basic tools for becoming a creative and innovative trainer. Although geared to educate educators, the style and philosophy are applicable to almost any training situation, and the widespread use of the resource among trainers supports the philosophy that innovative and active participation in adult education is the key to successful learning experiences.

Available for $8.00 plus postage from World Education, 1414 Sixth Avenue, New York, New York 10019, U.S.A.

Reviewed by Jan Elster, a Washington-based training specialist.

2 ***Training for the Cross-Cultural Mind: A Handbook for Cross-Cultural Trainers and Consultants,*** by Pierre Casse (Washington, D.C.: Society for Intercultural Education, Training, and Research, 1979), 228 pp.

In *Training for the Cross-Cultural Mind,* Pierre Casse has prepared an appetizing "cookbook" with detailed plans, exercises, and readings for conducting cross-cultural training. He defines cross-cultural training as a "systematic way of acquiring or modifying knowledge, skills, attitudes, and behavior in relation to becoming aware of, understanding, and relating to people who belong to different cultures or micro-cultures."

The method Casse recommends for "learning how to learn" in intercultural training programs is the workshop method. Each of the 17 workshops that Casse outlines here begins with a specific aim and specific objectives to be met with a process. The process in each case is a series of suggested exercises and inputs of concise conceptual and explanatory information. Lists of handouts and readings are included for each workshop. Some sample exercises give an idea of the range of the topics: exploring the different dimensions of culture shock, experiencing cross-cultural confrontation, using cross-cultural adjustment as an opportunity for personal growth, assessing the usefulness of cross-cultural training programs.

Casse's five-part formula for training the cross-cultural mind is the organizing principle of the book and of the process for each exercise: *discovering* intercultural realities; *inventing* — learning how to cope; *producing* practical guidelines; *conceptualizing* basic components and principles; and *evaluating* the effectiveness of training and learning. He draws his process from the double-loop learning method of C. Argyris and the total experiential learning concepts of Carl Rogers.

The emphasis of the book is highly positive, and the flavor of the book is practical, related

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to actual human needs and experience involving survival, meaning, communication, culture shock, empathy, negotiation, and training. Conceptually, it relates to the major scholarly contributions in philosophy, psychology, education, anthropology, sociology, and business. The reading lists are a well-blended resource, inviting and intriguing the reader toward further study. The text is enhanced with a wide variety of quotations, most of these from Western literature. Missing, except for a few random quotes from the *I Ching*, are insights from Eastern philosophy. This omission is natural, as systematic analysis itself is a Western idea and a product of recent industrial management studies.

The text does reach toward holistic thinking with references such as "A Gestalt Orientation to International Understanding." This is frequently the point at which Eastern thought begins. It would be intriguing to see this work interpreted into other languages and cultural frames of reference. The allusions to Jung then might come out as "Confucius say . . . ." Essentially, this is what should flow from Casse's work. There may be a million individual programs created by people who discover, invent, produce their own material, conceptualize it in terms of their own relevant experience, and evaluate it in terms of their own cultural and societal goals.

The book is spiral bound and utilitarian. People will undoubtedly tear out pages and make copies of exercises for their own groups. The illustrations are most helpful. Near-abstract photographs set the mood for each section, and well-chosen diagrams and illustrations help one visualize the concepts.

Throughout the book the wit and enthusiasm that Casse brings to his World Bank programs and numerous other appearances enliven the topic and prevent its settling into a pedagogic tedium. The book will certainly prove a valuable resource for the many who are now beginning to bring cross-cultural insights to their own work. Casse's systematic approach to the subject makes for easy comprehension. The simplicity of language without sacrifice of meaning will no doubt be appreciated by readers for whom English is a second language.

In his preface, Casse gives credit to a great many others who have contributed to his own thinking and the ideas used in the book. It is essentially a Casse *tour de force*, however, and greatly to his credit that he has been able to synthesize the essence of each contribution and recombine it so skillfully into such a useful handbook.

Available for $12.50 from SIETAR, 1414 22nd Street, N.W., Washington, D.C. 20037, U.S.A.

Reviewed by Wilbur T. Blume, a consultant in international communication in Washington, D.C.

3 One of the Clearinghouse's major functions is to alert its network members to resource materials that will help them get access to information for planning and implementing development activities. The materials reviewed below are recent publications that have compiled and organized, with varying degrees of success, information on resources in communication planning, distance education, funding assistance for broadcasters, international development, appropriate technology, and international population activities.

- ***Communication Planning at the Institutional Level: A Selected Annotated Bibliography,*** by Ronny Adhikarya and John Middleton (Honolulu: East-West Communication Institute, 1979), 99 pp.

The authors have selected for inclusion in this bibliography materials related to "the deliberate and systematic effort to organize and coordinate communication activities to support or meet the goals of a particular organization . . . and/or to support or meet the goals of a particular program . . . ."

The bibliography classifies publications according to a number of categories useful to the planning process: policy making, planning and strategy development, implementation, training, and evaluation. The index includes a special section on the communications planning process. An appendix lists journals and periodicals that were consulted during the literature search. A difficulty inherent in many bibliographies, and not resolved here, is the lack of information for obtaining the materials cited. In the absence of a large well-stocked library, most users in other countries will have to rely entirely on the annotation for their information.

Available for $6.00 from the East-West Communication Institute, 1777 East-West Road, Honolulu, Hawaii 96848, U.S.A.

- ***Distance Education: Selected Titles*** (The Hague: Bernard van Leer Foundation, 1979), 291 pp.

In this resource volume the Bernard van Leer Foundation has done a creditable job of resolving the problem of access to materials. In a lengthy appendix they provide thoughtful suggestions for finding publications by discussing microfilm and microfiche resources and how to use the Educational Resources Information Center (ERIC) data base, and by listing the world repositories of complete ERIC microfiche collections. They also describe other data bases and how to access them, and how to tap the resources of the United Nations family of organizations. Although this is a straightforward, unannotated listing of materials related to distance education, the subject index divides the 1,866 entries into country references and into many useful subject areas such as educational radio, telephone instruction, and correspondence courses. One appendix provides addresses for further information.

Available from the Bernard van Leer Foundation, P.O. Box 85905, 2508 CP The Hague, Netherlands.

- ***Source Directory: Assistance to Third World Broadcasters,*** prepared by Miriam Williford (New York: Ford Foundation/ British Broadcasting Corp., 1979), 78 entries.

This publication identifies donors and types of aid to broadcasters in the developing world, with no claim to exhaustiveness. The directory organizes financial and technical assistance entries by world region, with a separate section devoted to the United Nations. A typical entry identifies an organization's relationship to Third World broadcasting, its resources and services, key personnel to contact, the source of funding, and future program directions. A looseleaf binder format leads one to hope for an ongoing service.

Available for $5.95 (prepaid) from The Ford Foundation, P.O. Box 559, Naugatuck, Connecticut 06770, U.S.A.

- ***Acronyms Relating to International Development,*** compiled by Margaret Carroll (Ottawa: International Development Research Center, 1980), 162 pp.

The International Development Research Centre, recognizing the ever-expanding worldwide use of acronyms, comes to the aid of those who find themselves confused as to whether CIMMYT is the rice or corn research center, or whether it is the IIEP or IBE that is in Geneva. Unfortunately, this guide to acronyms is an enormously useful idea that has been only partially realized. The logical next step after spelling out the acronym and giving the organization's city and country location would be to provide an additional line of address so that one can contact the organization. With this addition, the next edition should be perfect!

Available for $9.00 within the U.S. from Unipub, Box 433, Murray Hill Station, New York, N.Y. 10016. Others may order from the Communication Division, IDRC, Box 8500, Ottawa, Canada K1G 3H9.

- ***Directory of Development Resources,*** edited by Robert E. Gaul and Helen A. Wilson (Washington, D.C.: Agency for International Development, 1979), 166 entries.

Published by AID's Office of Development Information and Utilization, this directory of development resources lists data banks, clearinghouses, newsletters and journals, and technical support capabilities. Most of the organizations listed receive AID funding to provide these services. Readers are directed to other information services provided by AID to development professionals. A separate listing includes academic and research institutions and

organizations outside of the U.S. that have a development focus. Institutions of agricultural research, both in the U.S. and abroad, are particularly well represented. The directory is well organized and easy to use.

Available in English, French, and Spanish from DS/DIU Resource Utilization Division, Agency for International Development (AID), Washington, D.C. 20523, U.S.A.

● ***International Directory of Appropriate Technology Resources,*** compiled by Brij Mathur (Mt. Ranier, Md.: Volunteers in Technical Assistance, 1979), 250 entries.

Documentalist Brij Mathur understands full well the need for clear, useful information and has organized this directory of 250 appropriate technology organizations to provide maximum assistance to the user. The directory provides information on each organization's type, activities, and functions related to appropriate technology, library and inquiry services, and publications. One section of the directory provides information on the organizations alphabetically by country. Another large section lists sources for publications, reports, and papers, including prices. A subject index provides access to information in both sections.

VITA has also published a useful regional ***Directory of Development Resources: Africa,*** compiled by Dennis Culkin. Organized in the same fashion as the appropriate technology directory, this directory of 187 entries covers a wide range of development activities. It lists institutions in such areas as housing, vocational training, social services, and cottage industry resources. The entry for Botswana's Brigades Development Centre, for example, reveals that it is government supported and that its objectives are training for primary school leavers, creation of rural employment, and promotion of small rural enterprises. Its services include management and technical assistance, marketing studies, extension services, responses to written inquiries, and a monthly newsletter.

Each of the above documents is available for $19.95 (postage extra), from VITA, 3706 Rhode Island Avenue, Mt. Ranier, Maryland 20822, U.S.A.

● ***Guide to Sources of International Population Assistance 1979*** (New York: UNFPA, 1979), 413 pp.

Not restricted to agencies and organizations solely concerned with population activities, this guide gives a lengthy narrative description of many of the UN family members (including their regional addresses), regional organizations and agencies such as the Asian and Pacific Development Administration Centre, bilateral agencies such as the Norwegian Agency for International Development, non-governmental organizations, university and research centers, and training organizations (many of the latter more specifically population oriented). In addition to general information about an organization, each entry indicates organizational support activities, channels of assistance, and directions for applying for assistance. This kind of comprehensive information is difficult to find, so both the compilers of the information and those organizations that responded so generously to the compilers' requests for information are to be commended.

A companion volume to the Guide is the sixth edition of UNFPA's ***Inventory of Population Projects in Developing Countries Around the World 1978-79.*** (New York: UNFPA, 1980, 605 pages). One portion of the inventory consists of a country-by-country identification of each government's position on and multilateral, bilateral, and non-governmental assistance to population and family health projects, as well as brief demographic facts. A second section is divided into regional, interregional, and global project listings. A source section covers organizations' publications, and lists organizations to write to for additional information. An alphabetical index completes the volume. Much information can be gleaned by a careful reading of this reference document – budget information, research and training resources, policy priorities, new program approaches, and sources of assistance.

Development professionals may contact UNFPA for information about the availability of these two volumes: United Nations Fund for Population Activities, 485 Lexington Avenue, New York, N.Y. 10017, U.S.A. ■

Reviews by Judy Brace.

Articles to Note

"Communication: A Vehicle for Development," by Jane Bunnag, in *Populi,* Volume 7, Number 2, 1980.

Bunnag effectively critiques the models on which most development communication programs have been based, basically the Western mass media model. Even where interpersonal communicators have been called on to play a larger role, they have too often been programmed along traditional mass communication lines, to provide information rather than to educate, failing to enlist the participation of the community. Bunnag sees traditional development communication research models as fundamentally flawed: the problem for study has usually been defined as *"how* do we *communicate* this innovation so that this audience adopts it," rather than an unstructured probing of the needs, perceptions, and larger communication context of the audience. Bunnag also calls research methodologies to task for distorting the data collection process by trying to distill complex varieties of meaning into quantifiable variables. She proposes the development of new models of communication research that would rely much more heavily on contextual research of an anthropological nature, incorporating traditional survey approaches only in areas that are quantifiable. The focus of the new model would be to engage "audience participation" in the development process.

"Education Sector Policy Paper," a review by James Potts, in *Educational Broadcasting International,* September 1980.

Potts takes on this review of The World Bank's sector policy paper on education, issued in April 1980, with the justification that the paper "is likely to prove the single most important book published this decade in terms of influence on educational policy, finance, and development." Potts notes that, although the comments in the text regarding the Bank's history in educational broadcasting are "a bit thin," a careful reading reveals "a strong commitment to the continuing use of the media." The paper reveals a fortunate emphasis on educational efficiency (". . . the Bank will support projects involving curriculum development, preparation of instructional materials, the training of teachers, and the use of mass media and distance learning techniques"), management, training, and software development. It also reaffirms a concentration on assistance to education for the poor and for women. Given the effects of inflation, the Bank indicates some willingness to use qualified local consultants rather than more expensive foreign experts in certain situations, and to cover incremental operating costs in funding arrangements. Potts notes that the paper reflects a tempered enthusiasm for non-formal education and some ambivalence about educational television; he attributes the latter to "the bias of economists."

"Broadcasting Development and Research in Tanzania," by G. O. Coldevin, in *Journal of Educational Television,* Volume V, Number 3, Autumn 1979.

Coldevin has written a refreshingly readable history of broadcasting in Tanzania from independence in 1961 through mid-1978. He describes briefly the limited television broadcasting experience on Zanzibar and Pemba (islands off of the Tanzanian coast), which consisted of two and one-half hours of broadcasting daily at the time of his study. The bulk of the article concentrates on the five mass mobilization radio campaigns that took place between 1969 and 1975, and on the use of radio to support the ongoing national literacy project. Acknowledging some of the problems connected with the mass mobilization campaigns – scheduling conflicts, inadequate distribution of print materials, overcrowding in study groups, insufficient training of group leaders, too much time between campaigns, too little attention to evaluation – Coldevin nonetheless finds the Tanzanian experience with radio impressive. ■

Communications and the Status of Women

Has the status of women improved measurably since the Mexico City conference that initiated the United Nations Decade for Women (1976-1985)? At that 1975 conference, a plan of action was devised around the triple objectives of equality, development, and peace. In July 1980, mid-Decade, a world conference was held in Copenhagen to consider progress toward the goals set in Mexico City and to set priorities for the second half of the Decade around the sub-themes of employment, health, and education.

According to the provisional text of the final report of the Copenhagen conference, "the review and appraisal of progress achieved during the past five years indicates that in many countries the situation of women from the so-called 'backward' sectors has worsened, . . . in particular . . . with respect to the conditions of employment and education for women in the rural and the so-called marginal urban sectors . . . . Illiteracy rates for the female population appear to have increased and are projected to increase for several countries . . . ." In many countries, "the wide gap between the economic opportunities available to men and those open to women has not been reduced in proportion to the increases achieved in overall economic growth."

To be sure, this lack of progress in the developing countries is not all for want of trying. The conference report emphasizes that "the current world economic crisis has contributed to the worsening situation of women in general . . . . In developing countries the negative impact on women is even greater than in developed countries, . . . and recent studies on the impact of international economic problems on the employment and working conditions of women show that in fact their adverse effects on the wage levels and job stability of women are more extensive than on those of men."

Thus, the situation in terms of equality for women is still well below the mark and not really improving. Women "represent 50 percent of the world adult population and one-third of the official labor force, they perform for nearly two-thirds of all working hours and receive only one-tenth of the world income and own less than 1 percent of world property."

Given these facts, renewed and even more intensive efforts to promote the status of women are needed worldwide. Communications can play an unquestionably important part in such efforts – but do they? Prior to and in preparation for the Copenhagen conference, the United Nations published two reports assessing the record of the media in portraying and involving women. The first of these, *The Portrayal and Participation of Women in the Media,* was prepared by Margaret Gallagher of Great Britain's Open University, and published by UNESCO (Division of Development of Communications Systems, Culture and Communication Sector, 7 place de Fontenoy, 75700 Paris, France).The second was the report of the U.N.'s special rapporteur, Esmeralda Arboleda Cuevas, on the influence of the mass communication media on attitudes toward the roles of women and men in present-day society (U.N. Document #E/CN.6/627, 10 January 1980).

A seminar was held at U.N. headquarters in May 1980 to discuss the findings of these reports. Participants agreed that, "in spite of the many recommendations and proposals concerning the image, access to, and participation of women in the media made since the International Women's Year in 1975, fundamental problems in this area persisted . . . ."

In July, a step toward strengthening international communication among and about women was taken at the Mid-Decade Forum, an independent activity that ran concurrently with the world conference in Copenhagen. The forum provided a less structured opportunity for non-governmental groups to exchange ideas. As part of the forum, Women's International Network News *(WIN News)* coordinated three panel discussions on "Women's News Media around the World," with more than a dozen women editors and publishers sharing their experiences. The broad purpose was to encourage more women to start publications that support communication among women about their own concerns and that report on women's issues treated inadequately by the international press and by traditional women's journals.

In addition to the individual reports by panel participants that are summarized below, the panelists formulated a joint statement to be sent to the U.N. Conference Secretariat, indicating that "publishers of national women's media with international links share the same problems around the world," and that the meetings had therefore established that "an annual (or biannual) meeting of women publishers/editors should be organized with United Nations support to gain international funding. The objective is to strengthen international communication between women and change women's image around the world." The statement was not published in *Forum '80,* the conference newspaper, so it did not get the broad degree of support that it might otherwise have received.

The following comments summarize the discussions and presentations of the women editors and publishers from the developing world who served as panelists for the sessions:

- Kate Abbam, Editor/Publisher, *Obaa Sima,* Ghana: *Obaa Sima* ("Ideal Woman") has been publishing since 1971. The main purpose of the journal is to give the women of Ghana a voice and to speak out for them. Regular features include a page by a doctor, dealing with medical matters. A nurse provides everyday advice on selected subjects, and the family and children's articles are designed to educate. *Obaa Sima* and Kate Abbam's work have earned international recognition. Her publication is urgently seeking financial support, as the general economic downtrend in Ghana has made publishing increasingly difficult and expensive. (*Obaa Sima,* P.O. Box 5737, Accra North, Ghana)
- Jyotsna Tribhuwan, Publisher and Editor, *Women's Forum,* India: The *Women's Forum* has been published for a number of years by Jyotsna Tribhuwan, a lawyer, who, according to her statement, "became convinced due to my legal practice that women need better communication among each other to jointly press their own concerns." The *Women's Forum* is thus concerned with legislation for women in India and lobbies with government bodies. It is also concerned with international matters, establishing communication with U.N. activities and bodies, actively supporting the U.N. World Plan of Action, and reporting regularly on U.N. activities. (*Women's Forum,* Ahmednagar, India)
- Madhu Kishwar, Editor, *Manushi,* India: "We started out with no experience. . . . Several women got together in April 1979 and drafted a proposal to publish a women's magazine. The first issue had a very enthusiastic response. We survived by individual subscriptions and donations, and we managed to collect a little bit of money before we started. We do not accept any large grants because this would make us dependent. We do not accept any sexist advertising. We mainly use personal contacts to get the money for printing. We now publish 10,000 copies (our first edition was 2,000), distributed entirely by women. We get many letters from women all over India; we encourage them to translate into local languages and make regional editions." (*Manushi,* C1/202 Lajpat, Nagar 1, New Delhi 110024, India)
- Patricia Lone, Associate Editor, *Viva Magazine,* Kenya: *Viva* is a glossy women's magazine that, according to Patricia Lone, has to survive by catering to advertisers and including columns on women's fashions and other traditional women's concerns. *Viva* has been able to develop an excellent staff of African women reporters and writers who have published many in-depth articles on some of the social problems facing women in the developing Kenyan society.

As Patricia Lone admitted, due to the fact that up to 80 percent of Kenyan women are illiterate, the magazine reaches only women in the modern sector, in government, and those who in many ways are highly privileged, including women decision makers. In-depth discussions of women's legal rights, women's access to jobs and education, and women's participation in government and decision making have characterized the contributions of this publication. *(Viva Magazine, Box 46319, Nairobi, Kenya)*

Panelists from the developed world included:

- Katie Breen, Editor, *Marie Claire,* 11 Bis rue Boissy d'Anglais, 75008 Paris, France
- Daniela Colombo, *Effe,* P. Campo Marzio, 00186, Rome, Italy
- Ikuko Atsumi, *The Feminist Japan,* 6-5-8 Todoroki, Setagaya-ku, Tokyo, Japan
- Fran Hosken, Editor, *WIN News,* U.S.A.: In its column on "Women and Media," *WIN News* reports regularly on publications by and for women. It also exchanges publications and information with the women's press in all parts of the world, providing reviews and content summaries of dozens of publications.

The sum of the experience of the editors and publishers shows that it is possible to publish and learn while you go if you are willing to contribute your own time. However, most women's publications are constantly beset by financial problems and exist only on the commitment of their staff. Therefore, it is especially important to organize internationally with a view to establishing international support, including international funding, and to launch more women's publications in countries that do not have any as yet.

The worldwide media column of *WIN News* will serve as an ongoing communication link between editors and publishers. All of those interested in participating in this action to create support for ongoing exchange, cooperation, and meetings between women editors and publishers are invited to write to Fran Hosken, Editor *WIN News,* 187 Grant Street, Lexington, Massachusetts 02173, U.S.A. ■

Information used in this article was contributed by Fran Hosken of *WIN News.*

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On File at ERIC

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- Colle, Royal D. ***Developing Health Education Programs in Rural Areas.*** Paper prepared for the Second International Congress of the World Federation of Public Health Associations and the 69th Annual Conference of the Canadian Public Health Association. Halifax, Nova Scotia, Canada, May 1978, 25 pp. (ED 182 082)

If primary care is to be provided to remote rural populations in developing countries, alternative and innovative delivery systems emphasizing community participation, use of paraprofessionals, and health education programs must be considered. A 1977 American Public Health Association study of 180 health projects in developing countries reveals that 92 percent of the projects are offering some sort of health education service, indicating the serious emphasis placed on the health education component. Methods being utilized to make health education a more effective part of the primary health system include radio campaigns in Tanzania and in Assam, India, and audiocassette programs for both group and individual listening in Guatemala and India.

Cassette communication, a simple, low cost, portable, durable, flexible, and accurate means of delivering instruction, is being used for paraprofessional in-service training in Colombia, and a Guatemalan project uses cassette and record/playback systems to assist student doctors in expanding the quality and quantity of their contacts with rural people. These programs have substantial potential, but unless there is strong political commitment to the systematic use of communication and administrative record keeping, it will be difficult to implement and assess innovative health education strategies. Available from EDRS in microfiche for 83¢ or in paper copy for $1.82 plus shipping.

- Vella, Jane Kathryn. ***Visual Aids for Nonformal Education: A Field Guide to the Production and Use of Inexpensive Visual Aids in Nonformal Education.*** Amherst, Massachusetts: University of Massachusetts, Center for International Education, 1979, 47 pp. (ED 183 214)

The effectiveness of visual aids in nonformal education depends on their relevance to the audience with which they are used, and this guide provides a discussion of various factors fieldworkers should consider when designing and using simple visual aids in developing countries. Four specific types of visual aids are discussed in some detail – found objects, charts, pictures, and models – and suggestions are offered for producing these four prototypes. Uses for such inexpensive materials as newsprint, masking tape, and felt pens are indicated, and four books providing additional information on the design and production of visual aids are listed. Available from EDRS in microfiche for 83¢ plus postage.

- Fuglesang, Andreas, ed. ***The Story of a Seminar in Applied Communication. The Dag Hammarskjold Seminar on "Communication – An Essential Component in Development Work".*** Uppsala, Sweden: Dag Hammarskjold Foundation, 1973, 141 pp. (ED 180 735)

The objective of this two-week seminar in 1972 was to break away from traditional and theoretical concepts of information work in order to gain a practical insight into communication, especially as it applies to social and economic development. Fifty participants and lecturers from developed and developing countries in Europe and Africa focused on applied communications, management, sensitivity training, the function of work models, and group dynamics in a series of reports, lectures, discussions, and experiments.

Reports on communications programs in each represented country were followed by talks on specific issues, including transition and social change in rural and industrialized societies, the function of communication in the change process, the crucial management problem of internal communications, radio communications, and models as applicable tools. The seminar concluded with presentations on total communications campaigns in the fields of nutrition, family planning, and traffic, and a participant evaluation of the program. Some articles in the report are adaptations of the seminar lectures. Available from EDRS in microfiche for 83¢ or in paper copy for $9.32 plus shipping. ■

Barbara B. Minor, Publications Coordinator, ERIC Clearinghouse on Information Resources, School of Education, Syracuse University, Syracuse, New York 13210, U.S.A.

Letter to the Editor:

I have read with interest "Is Literacy the Only Road to Learning? Basic Education by Radio Is an Alternative," by Dwight W. Allen and Stephen Anzalone (*DCR* 30). Some of us here in India have been working on the same question, from a different perspective.

We agree with the basic argument suggested in the article that the initial point in nonformal education need not be literacy. The question that we have been asking is whether literacy is the only way to orient those who are deeply immersed in the various processes of oral culture to the processes of modernization

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reliant on the print media. We have also been asking whether there is an immediate need for literacy in cultures that still conduct most of their transactions through face-to-face individual or group communication.

An assumption underlying such questions seems to suggest that the life patterns and communication needs of these communities do not have any unavoidable uses of the print media. . . . The predominance of oral culture in traditional societies does in fact give rise to a genuine skepticism as to the need for literacy or even written culture. The various transactions in life have long been conducted without any written document, and newer modes of conducting transactions need not always be preceded by control over literacy skills; other media can be used to strengthen and expand oral interaction.

What has bothered us in this stipulation, however, is the question of the attitudes that learners bring to the very process of education and the manner in which they perceive its various instrumentalities. One might say that the learners go largely by stereotypes formed on the basis of their attitudes. They have one set of responses to a setting that has a teacher, a classroom, a textbook, a group of students, and other learning aids. Thus, within the non-formal framework of education, they expect a certain kind of formalism. This attitude is based partly on their pride at being participants in the learning process and partly on a desire to advance like the others (their more well-off compatriots).

Learners have another set of expectations for the radio (or television). This medium has been to them a kind of entertainment that carries an appeal wider than that carried by artists in their own area or within their experience. Their response to this prepackaged entertainment is deceptively simple and exclusive. The film songs, story sequences, and actors' voices, reinforced by the learners' occasional exposure to cinema/television, generates in them a situation-specific response to the radio.

One can theoretically argue that the content and techniques in radio programs can be imaginatively arranged, that it may be possible to mix education with entertainment. There is a great deal of validity in this kind of exercise. However, as indicated earlier, the adult learner's response is in terms of stereotypes; different media of education are responded to differently. There is one response to the teacher, another to the elder or temple priest, and yet another to the faceless "speaking" box.

I am not suggesting that no education takes place through radio. The authors have cited experiments in several countries where the process of education has been successfully initiated through radio. I feel, however, that the number of persons so "educated" would not differ substantially from the number made literate through adult education centers. Nor would the cost be significantly different.

Let us not forget that the message conveyed through this channel of transmission is unlikely to match the immense variations observed in the characteristics of the adult learner population: age, sex, income, caste, religion, motivation, attitude to learning, etc. Let us also not forget that radio is essentially a part of the written culture, even though its medium is oral. Most radio programs are pre-written, duly edited, and rehearsed; they seem to have all of the attributes of any pre-packaged message. It would be difficult to claim that radio programs have the attributes so vividly observed in face-to-face communication . . . .

It seems to me that nonformal education with literacy as one of its several elements is going to require a multimedia approach, both oral and visual. It needs to take into consideration the very effective role being played by folk arts. Andreas Fuglesang suggests that "in the oral culture the legends, the myths, the epic poems, and the proverbs are mechanisms for information storage. The fable is a memory device. Society's future depends on the good function of the memory of the elders. The word is a thing. You have it when you say it."

It is difficult to know whether the "word" retains the same communicational vitality and essential ring of sincerity once it is transmitted through a faceless channel. ■

S. C. Bhatia, Coordinator of the Delhi University Adult Education and Continuing Education Cell.

The Authors Reply:

We appreciate Dr. Bhatia's response to our article and the points he raises.

Our purpose in the article was to encourage greater consideration of the possibilities offered by radio for basic education for adults. We believe that radio has the potential to play an important, constructive role in adult education. Whether that potential is realized in practice is a different question and one that must take into account the points Dr. Bhatia mentions.

We agree that attitudes are fundamental in any systematic use of mass communications for education. But here we believe that different attitudes toward media and toward a teacher are not necessarily prejudicial to the instructional effectiveness of the former. In the United States, for example, children's expectations from and responses to television programs are far different than those from and to a teacher in a classroom. The number of children learning to read as a result of the television series *Sesame Street* proves that entertainment expectations need not detract from learning.

Our urging of more consideration for an educational role for radio does not mean that we would wish to do away with other adult education activities any more than we would want *Sesame Street*-type programs to replace schools. We are not championing radio as a quick technological fix or panacea. We *do* believe that basic education by radio, if well designed and used in appropriate situations, can have much to offer in a strategy for adult education.

We were delighted to hear of Dr. Bhatia's efforts in conducting nonformal education without literacy as a starting point. Although such an appreciation led us to recommend a greater role for radio, it can lead to other possibilities as well. The direction Dr. Bhatia and his colleagues are following seems to us to be most worthwhile. ■

Dwight W. Allen and Stephen Anzalone

Nutrition Communication Project

Current data collected by the World Health Organization, UNICEF, and others links increased incidence of infant mortality to early weaning and a trend away from breastfeeding. Low-income mothers in developing countries, lacking the knowledge, purchasing power, and sanitary facilities to use and prepare infant formula and other breast-milk substitutes adequately, need nutrition education to teach them the full range of infant feeding skills. One project created to help meet this need is the International Nutrition Communication Project.

This four-year project, financed by the Agency for International Development and coordinated by the Education Development Center (EDC), provides technical assistance in using educational resources to improve the nutritional status and well-being of low-income families. Project staff and consultants help host country planners identify nutrition education needs, resources, and target groups; develop appropriate communication strategies; and evaluate the impact of nutrition education programs. In addition to its concern with activities to improve infant feeding and weaning practices, the project seeks to have an impact on a wide range of social and cultural factors that influence dietary behaviors susceptible to change.

A nutrition education clearinghouse has been established at EDC to collect and disseminate outstanding messages and materials to nutrition education fieldworkers and program coordinators. The project will publish an Annotated Directory of Nutrition Education Projects and a Case Study Manual of selected nutrition education interventions, both to be updated annually.

For information contact Ronald Israel, Project Manager, International Nutrition Communication Project, Education Development Center, 55 Chapel Street, Newton, Massachusetts 02160, U.S.A. ■

Two-way Radio

(Continued from page 3)

successful operation of a two-way radio system. Some systems have only enough funds to acquire the original equipment, thus when spares are required, they may be difficult to obtain, or the government may have insufficient foreign exchange to buy them.

Power supplies are a persistent technical problem. In locations with an existing power source (perhaps a town power supply or a generator for a hospital), voltage regulators may be needed to prevent damage from power surges. If voltage is much below specified output, it may not be possible to use local power to run the radio or recharge its batteries.

A common self-contained power source for two-way radios is a standard 12 volt DC automobile storage battery, recharged by a small diesel generator that must be properly cleaned and maintained. The cost and logistics of transporting diesel oil to remote locations – often it must be flown in – can make this one of the highest costs of operating a radio system. In contrast, solar panels can serve as the recharging source and can eliminate the need for generators and fuel. Although at present their capital cost is higher, they are becoming less expensive, and they require little maintenance until replacement is necessary. Field tests do not indicate any major problems with solar panels, but none have been in use long enough for definitive evaluation.

Another set of causes of system failure or abandonment relates to the perceived utility of the system. If it is to be valued and used by the rural health worker, the radio must be a respected and integral part of the health delivery system. Lack of support and continuity for field facilities will encourage health workers and patients to by-pass lower levels of care in favor of overcrowded hospitals, where all illnesses can be treated and referral is not necessary.

Conclusions

Several lessons can be drawn from the sum of experience with two-way radio systems:

- the equipment must be reliable and simple to use;
- system budgets must include adequate allocations for operations, maintenance, and spare parts;
- training operators in proper use of the radios and in preventive maintenance can extend the life of the system;
- regular operating schedules and procedures can increase the effectiveness of the system;
- educational programming requires good audio quality;
- educational applications require a greater investment in personnel time than do consultative and administrative applications.

As more experience is gained in using two-way radio as an integral part of rural health projects, it is probable that we will learn how to avoid the organizational problems now associated with such systems, and that the improved combination of health personnel and communication systems will permit even greater penetration of health care into rural areas. ■

This article is excerpted from a paper prepared by the authors for a seminar on "Two-way Communications for Rural Health Services in Developing Countries," held in June 1980 with the support of the National Academy of Sciences and USAID. Copies of that paper, "Two-Way Radio for Rural Health Care," are available from the Clearinghouse.

Douglas Goldschmidt, associate director of the Rural Satellite Program at the Academy for Educational Development, is working with MEDEX Guyana on the expansion of its two-way radio network.

Heather E. Hudson, director of telecommunications applications for AED, has been involved in planning and evaluating health communication projects in Alaska, northern Canada, Guyana, Lesotho, and Sudan.

Wilma Lynn, currently with the Population, Health, and Nutrition Division of The World Bank, recently conducted a study of two-way communication projects for AED.

East African Network

(Continued from page 4)

monthly average of 2,200 calls, 26 percent are in the medical category, 3 percent relate to drug supplies, 14 percent to flight coordination, 30 percent to routine matters, and 27 percent to administration.

Management and Evaluation

In 1979, a Radio Committee with membership from AMREF's Radio Room, Aviation, Medicine by Air, and Projects Divisions, chaired by the Medical Director, was established to coordinate the diverse operational aspects of the radio system and to discuss and decide upon changes and improvements. Standardized forms for recording calls at outstations were designed and sent to network participants, together with a questionnaire designed to solicit information for purposes of evaluating the radio system and its uses.

The current evaluation, begun in January 1980, is being conducted by an outside consultant engaged by AMREF to assess the effectiveness of its medical radio communication system and to consider its potential for replication. The preliminary results of this evaluation, to be available shortly, are likely to substantiate the widely shared opinion that the AMREF medical radio network is an enviable example of a well-run two-way communication system worthy of replication in other parts of the developing world. ■

Michael Gerber is executive director of the International Medical and Research Foundation (the U.S. affiliate of AMREF), 833 United Nations Plaza, New York, New York 10017, U.S.A.

Dilemma

(Continued from page 16)

not tend to bring out the best in people. Certainly all of us were involved in the project to pursue our own interests. The problem is that the collective effect of this self-aggrandizement and indulgence affected the project in profound ways, much to the detriment of those on the receiving end.

Even in the Indian villages, we discovered a labyrinth of political ties and conflicts that will, in the long run, require attention by those souls hardy (or foolhardy) enough to attempt to impose social change from the outside. The radio station was supposed to work closely with established health and nutrition leaders in these villages to support the educational content coming over the radio through informal conversations, group chats, and seminars. In the three villages selected for the baseline study, all of these leaders were connected through close kinship ties to the ruling village elites. Unfortunately, the women most lacking in basic health and nutrition information had only marginal interpersonal communication networks with the leaders and the ruling elites.

These same women often reported contact with local *curanderos* (traditional medical practitioners), whose remedies could be bought with payment in forms other than the money required to purchase the health leaders' imported medicines. Yet the entire project design, from the PVO through the coordinating committee to our own staff, chose to ignore the existence of the *curanderos* and the possible utility of traditional remedies.

With so many levels of competing and conflicting interests, it would seem that not much is left for the poorest of the Indian villagers to mold for themselves. What, really, can they control? Perhaps some of the rural people will offer or be requested to provide programming input, but veto power over what actually is aired rests with the radio staff, the committee, and the PVO.

Ultimately we will have to recognize that there must be real rewards for project recipients that will insure their participation, otherwise a project cannot really be "of the people." And if it is not, then we may in fact be faced with what Ivan Illich has termed "the modernization of poverty," where enterprising individuals progressively "develop" (or even create) needs of other people down the line for their own purposes.

The issue, it seems to me, is not *whether* self-interests will affect a project, but rather what they are, who their allies and enemies are, and how they interact. If we can recognize that self-interests are necessarily associated with any project, and that stronger programs can result if participants work in open knowledge of the reward expectations of every other person involved, then self-interest can be brought out into the open and made a constructive element in program design and implementation. ■

Gary Garriott is now a technical advisor with VITA.

Dilemmas in Country X: Candid Discussions about Failures

Development is a communication problem. People do things differently because they learn new ways, new techniques, and new technologies. Information flows best between people of equal and common interests . . . . The individual's self-interest provides the motivation for development. Communications must respond to that self-interest . . . .

William Ellis, in *TRANET*

These words condense much of the current thinking in development communication projects. A critical question is, where does self-interest fit into the development process? By the time a new project actually gets to the level of implementation, a great many self-interests have already pulled at its form and function, and will continue to do so. What then remains for the interests of the community and its people? What reward does the project have for those people whose participation is critical to project success?

I recently returned from a year in a developing country where I was assisting in hardware and software aspects of an educational radio station installation. The project was described as an effort to increase knowledge levels in health, nutrition, and agricultural information among the rural poor. Employed by a small Private Voluntary Organization (PVO), I was one of two outside coordinators on the project.

Although the stated objectives of the project certainly sounded worthwhile, my own participation was activated in large part by my desire for involvement in the planning and execution of a field study in network analysis. I was also looking for a short-term overseas cultural experience in a rural setting.

My co-coordinator was performing the field study to meet requirements for a Ph.D. degree, in exchange for administrative duties on the project. Both of us were interested in promoting as much local participation in programming and station operation as possible. The project itself, however, was a kind of experiment being imposed on the community, as the initiative for the project had come, not from the Indian population it was to serve, but from the PVO organization, which had competed successfully for donor agency money.

Proposed innovations abounded. On the technical side, our engineering consultant insisted on our raising an antenna of unproven design. Requests for a structural analysis went unheeded, and the first attempt to put it up was unsuccessful, with nearly fatal consequences. The second try was successful, but only after considerable local engineering and redesign. Why experiment full scale with an unproven technology? The rationale constantly repeated was replicability for future projects.

On the organizational front, an innovation required by my PVO was the establishment of a local coordinating committee made up of representatives from religious, educational, and community development organizations operating within the region. The committee was given responsibility for disbursement of about one-fifth of the total grant and was empowered to make local management decisions such as contracting for construction materials, hiring and firing personnel, etc. The requirement was wisely formulated: committee members collectively possessed the kind of local political leverage and savvy that meant operational tasks were performed quite well. However, since final veto power remained with the PVO, the committee had no voice over how the rest of the project's budget was to be spent, nor could it influence any substantial modifications in project policy.

Although there was some genuine concern by the committee for the well-being of the Indian people, committee members were also interested in the project for at least two selfish reasons. First, the majority of the members were aligned with the political machine then in power, and both party and personal benefits were to be gained through association with the project. Second, since most seats were held by civic and political powers aligned with the machine, other minority elements, including a vocal and politicized Indian group that was also represented, were effectively barred from introducing programming concepts that might challenge the status quo. For example, while it might have been true that lack of certain kinds of information contributed to the marginalization of the Indians, it was obvious that a systematic expropriation of Indian land and resources by the government and by wealthy individuals constituted the historical legacy of Indian impoverishment. Any suggested consideration of these issues was promptly branded "political" and disallowed.

Our staff — a director, two broadcasters, three secretaries, an office boy, an office girl, and a night watchman — were all quite straightforward about their seeking employment with the project solely for economic reasons. The director, an Indian by birth and no doubt genuinely concerned with the welfare of his own people, was nevertheless not very interested in continuing to live a life of rural poverty and was seeking a middle-class urban lifestyle with all its rewards. It was eventually discovered that he was falsifying receipts and embezzling government salary checks, and he was forced to leave the project.

Not that I blame him very much. Rising expectations, combined with high levels of anxiety and uncertainty about the future, do

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Two-way radio for rural health care delivery